85 is set on the pressure pipeline **83**. The supercritical vessel **86** is also set on the pressure pipeline **83** between the ^{14}C testing bottle **11** and the gas compressor **85**.

[0157] It is possible to set the valve **87** between the supercritical vessel **86** and the ^{14}C testing bottle **11** to control the inflow of carbon dioxide.

[0158] According to the instruction of the present embodiment, it provides a sampling and preparation method differed from the eighth embodiment, which includes the following steps:

[0159] Based on the eighth embodiment, during the transferring process, the solid carbon dioxide is transferred into the pressure vessel **84**, by warming the pressure vessel **84** slowly, using the heating device **81**, to convert carbon dioxide to gas phase.

[0160] By using the gas compressor **85**, the carbon dioxide is pumped from the pressure vessel **84** into the supercritical vessel **86** through the pressure pipeline **83**. The carbon dioxide in the supercritical vessel **86** is converted to supercritical state, by controlling the temperature and pressure of the supercritical vessel **86**.

[0161] Opening the valve **87**, and the supercritical carbon dioxide is pumped into the ^{14}C testing bottle **11**.

[0162] As a transformation of the present embodiment, it is possible to pump the carbon dioxide into the ^{14}C testing bottle **11** directly by the gas compressor **85**. The supercritical carbon dioxide may be generated in the ^{14}C testing bottle **11** by controlling the temperature and pressure of it. However, controlling this process is relatively difficult, with high failure rate, so it is not the optimal choice.

Tenth Embodiment

[0163] The tenth embodiment provides a sampling and preparation system, which further improves the sampling and preparation system in any of the seventh to ninth embodiments. The main improvement is that, in the tenth embodiment, as shown in the FIG. **13**, the filtering devices **2** comprise the following sequentially connected units: preposition dust filter **21**, dryer **22**, postposition dust filter **23**.

[0164] The flue gas suctioned by the sampling pump **7** is filtered primarily by passing the preposition filter **21**. After removing the most particulate matter in the flue gas, the moisture and particulate matter in the flue gas are removed completely by passing the dryer **22** and the postposition filter **23** sequentially, which may ensure the normal operation of the mass flow controller **3**.

[0165] Specifically, the postposition filter **23** may use HEPA rose box to enhance the filtering effect.

The Eleventh Embodiment

[0166] The eleventh embodiment provides a sampling and preparation system, which further improves the sampling and preparation system in the tenth embodiment. The main improvement is that, in the eleventh embodiment, as shown in the FIG. **14**, there is a cold trap **9** positioned between the mass flow controller **3** and the carbon dioxide trap **4**, and the temperature of the cold trap **9** ranges from minus 40 degrees Celsius to minus 60 degrees Celsius.

[0167] The positioned cold trap **9** may remove the impurity gases whose boiling point is higher than carbon dioxide, such as sulfur dioxide, nitrogen dioxide, sulfur anhydride and so on.

[0168] Compared to the prior art, this embodiment improves the purity of carbon dioxide by using cold trap **9** to purify and fix carbon dioxide, and improves the detection accuracy.

[0169] Those of ordinary skill in the art can understand that many technical details are proposed to provide readers with a better understanding of the present invention. However, even if there are no technical details and variations and modifications based on the above embodiments, the technical solutions for the claims of the present application can be substantially realized. Therefore, in practice, various modifications can be made in form and detail to the above embodiments without departing from the spirit and scope of the present invention.

1. A ^{14}C testing bottle comprising :
a pressure-bearing shell;
a sample bin positioned in the pressure-bearing shell, wherein at least part of the sample bin is transparent;
a cavity arranged in the sample bin, wherein, the sample bin diffuses light produced in the cavity;
an injection port connected to the cavity; and
an optical fiber channel set on the pressure-bearing shell, wherein one end of the optical fiber channel is connectable with an external scintillation counter and the other end of the optical fiber channel is connected with the transparent part of the sample bin.

2. The ^{14}C testing bottle according to claim **1**, wherein:
the transparent part of the sample bin is coated with a diffuse reflection coating on its outer surface; or
the sample bin comprises a body and a transparent sheet embedded in the body; and the body has an inner wall which diffuses the light generated in the body.

3. The ^{14}C testing bottle according to claim **1**, wherein, an insulation layer is arranged between the pressure-bearing shell and the sample bin;
the injection port is sealed by screwing a cover;
the ^{14}C testing bottle further comprising an air hole, the air hole connects through the pressure-bearing shell and the sample bin, and the air hole is sealed by a screw or a rubber plug; a sensor is arranged in the cavity, and the wire rod of the sensor is connected to the external terminal through the air hole; the cavity is spherical or cylindrical.

4. A^{14}C testing device comprising: an optical fiber, the scintillation counter and the ^{14}C testing bottle as claimed in claim **1**;
wherein, one end of the optical fiber is inserted to the optical fiber channel, and the other end of the optical fiber is connected to the scintillation counter.

5. A ^{14}C testing method comprising:
applying , a ^{14}C testing device to perform the testing method, wherein the ^{14}C testing device comprises:
an optical fiber;
a scintillation counter;
a pressure-bearing shell;
a sample bin positioned in the pressure-bearing shell, wherein at least part of the sample bin is transparent;
a cavity arranged in the sample bin, wherein, the sample bin diffuses light produced in the cavity;
an injection port connected to the cavity; and
an optical fiber channel set on the pressure-bearing shell, wherein one end of the optical fiber channel is connected with the scintillation counter and the other end